



Wisconsin Department of Transportation

2018 Internal Quality Assurance Materials Audit Update





Quality Assurance Program

Why is materials testing important?

- Assure that materials meet specifications
- Approximately 50% of construction dollars are spent on the PURCHASE of materials
- Reduces risk of fraud - protects public interest



Annual Materials Record Review

Each fiscal year BTS conducts a review of materials records from approximately 15 randomly selected construction projects to ensure materials sampling, testing, and documentation requirements are being met.



Scope of WisDOT QA Internal Audits

- ☐ All records should contain sufficient detail to sustain an audit and should be clear enough to be read and understood by persons not associated with the project.
- ☐ MTS and HQMS website are used to review test records.
- ☐ Important audit elements: qualified laboratories; certified samplers and testers; aggregate quality and source identification; QC & QV sampling and testing performed; random numbers documented; etc.



Source Documentation

CMM Section 8-30 - QMP General:

Source Documentation Is:

- Test data entered directly Into electronic document or original handwritten test data.

Project Record Submission:

- Records shall include the original source (electronic or handwritten) documents.
- A scanned copy of original source document Is acceptable.



Internal QA Audit Findings 1

Missing Random Numbers

- ▶ Random numbers not generated on one project.
- ▶ Random numbers were generated and written down, but computer generated sheets were discarded after sampling.
- ▶ Missing random numbers on a few ancillary concrete tests.
- ▶ Missing QV random numbers.



Internal QA Audit Findings 2

Missed QC Tests

- ▶ Contractor missed the last QC test for BAD 1-1/4". Offered to take another sample, but that would not be considered random.
- ▶ For Handwork Grade A, the contractor placed concrete into a 4th subplot; however, the predetermined QC random number was not reached for that subplot.
- ▶ For Handwork Grade C, the contractor placed concrete in only one subplot; however, the predetermined QC random number was not reached for that subplot.



Internal QA Audit Findings 3

Missed QV Tests

- Missed QV BAD 1¼" stockpile test. Contractor changed aggregate sources without notifying project engineer—QMP Base Aggregate STSP states QC and QV “Perform one stockpile test from each source prior to placement.”
- Missed QV HMA mix sample because QV sampler arrived at the plant too late and missed the random number.
- QV cylinders were cast but could not be broken since they were out of round. No QV test for lot 3. QV cylinders were not cast for lot 5 due to project staff oversight.
- Random QV number not reached for freshly mixed concrete.



Internal QA Audit Findings 4

Missed QV Tests

- ▶ Missing QV test for 21 CY curb and gutter because there was a last minute change by the contractor. The contractor decided not to use the machine on a portion of curb but to hand pour the curb integral with the pavement. The QV random location was at an area that was not poured until after the change. 716.2.1 states, Perform random QC testing for air and slump and cast 2 cylinders for each mix grade and placement method.” QV test was missed for the C&G machine placement method.
- ▶ No QV on 35 CY hand pour A-FA mix. Perform QC for each mix grade. There was a last minute change by the contractor due to cold weather conditions. The QV random location was at an area that was not poured until after the mix change, so QV was missed for the first mix.



Internal QA Audit Findings 5

Improper Reporting

- ▶ No loading rate calculated for QC compressive strength testing of concrete cylinders. Standard spec 710.5.5 states, “Use a compression machine that automatically records the date, time, rate of loading, and maximum load of each cylinder. Provide a printout of this information for each cylinder tested.”
- ▶ Two incomplete concrete mix design (prefix 132) reports.
- ▶ Missed slump and air content data on several 130 concrete cylinder reports.





*WHAT ARE WE
DOING? BUILDING
QUALITY ROADS*



Contact Information

Keith H. Lundin

Internal Quality Assurance Auditor

Quality Assurance Unit

Materials Management Section

Bureau of Technical Services

Division of Transportation System Development

Wisconsin Dept. of Transportation

Cell: 608-220-8847

FAX: 608-245-8959

keith.lundin@dot.wi.gov

